Application No. 09/324,920

REMARKS

In the Office Action dated March 28, 2001, the Examiner has rejected claims 1-3 as being anticipated by Melnikoff (U.S. Patent No. 5,729,000), Edesess (U.S. Patent No. 5,884,287), Barr et al. (U.S. Patent No. 5,761,442), and French (U.S. Patent No. 6,188,992). The Examiner has also rejected claims 1-3 as being indefinite.

In response, Applicant has cancelled claims 1-3 and have added new claims 4-33 to better define the invention and to clarify the distinctions between this invention and the cited prior art references.

New independent Claims 4 and 18 have been added to specifically and clearly require that changes to a dynamic portfolio be simulated, and to specifically and clearly require that the execution of trades of at least one trading instrument is simulated until the desired result of a trading strategy defined for the dynamic portfolio is obtained. Support for this amendment can be found in the disclosure at Page 2, line 15, Page 4 lines 21-31, Page 6, lines 13-17, Page 7, lines 26-27, Page 7, lines 30-31, Page 10, lines 30-31, and Page 11, 16-20.

Applicant respectfully traverses the Examiner's rejection of the claims and submits that the claims as amended define subject matter which is patentable over the cited art, for the following reasons.

It is submitted that new claims 4-33 recite a combination of features that is neither shown nor suggested by Melnikoff, Edesess, Barr et al., or French, taken alone or in combination.

New claim 4 recites steps in a method of determining risk associated with a portfolio comprising a plurality of instruments in a simulation, by simulating changes to the composition of the portfolio over a plurality of times of interest and under a plurality of scenarios. In particular, new claim 4 requires that a trading strategy be defined for the dynamic portfolio, wherein the trading strategy defines a desired result dependent on at least one tracked attribute, and wherein the trading strategy is associated with at least one trading instrument. Furthermore, new claim 4 requires that for each of the plurality of scenarios, changes to the composition of a dynamic portfolio be simulated, wherein the execution of trades of the at least one trading instrument is simulated until the desired result is obtained, and where the dynamic portfolio will have a changed composition after the changes are simulated. These and other features of the applicant's invention have the advantage over some prior art risk management systems (see e.g., page 2, lines 10-14 and lines 21-28) of permitting the dynamic portfolio to evolve in a simulation, and to provide users with greater flexibility in defining portfolio evolution strategies that more accurately reflects decisions, such as

investment decisions, that may be made under certain future scenarios in the simulation.

Melnikoff relates to a method of calculating rates of return of a selected portfolio based on historical data relating to investments for which market values and liquidation facilities are available on a regular, periodic basis. Melnikoff nowhere contemplates or teaches a method of simulating changes to the composition of the selected portfolio over time in view of one or more future scenarios to assess the risk associated with a portfolio. Melnikoff contemplates the actual execution of trades (see e.g. Melnikoff at claim 1, item (I), and claims 3-5) which are executed only after a desired portfolio is determined. The present invention, on the other hand, relates to the simulation of trades. This is used to determine a risk metric for the portfolio. If the risk metric were to be used as a measure of desirability of a portfolio, the determination of such a portfolio requires that the simulation of trades be performed prior to such determination according to the present invention, in contrast to Melnikoff.

Edesess relates to a system and method for selecting an optimal efficient portfolio from a generated array of efficient portfolios. Edesess nowhere contemplates or teaches a method of simulating changes to the composition of the selected portfolio over time in view of one or more future scenarios to assess the risk associated with a portfolio. Instead, standard mean-variance techniques are used in Edesess (see e.g., Edesess at col. 1 line 19 to col. 2 line 5, and col. 5, lines 54-55). The use of the term "scenario" in Edesess relates to a wealth goal (see e.g. Edesess at col. 2, lines 41-48), unlike the "scenarios" under which the simulations of the present invention are performed, in which values of risk factors or other information are defined (see e.g. page 5, lines 13-18, page 7, lines 4-7). Further, no trading of instruments, simulated or actual, is contemplated in Edesess.

Barr et al. relates to a neural network trained to construct an investment portfolio expected to outperform indices associated with domestic or foreign capital markets. Barr et al. nowhere contemplates or teaches a method of simulating changes to the composition of the selected portfolio over time in view of one or more future scenarios to assess the risk associated with a portfolio. Barr et al. contemplates the actual execution of trades (see e.g. Barr et al. at column 5, lines 14-18) which are executed only after an actual return is known, whereas the simulated trades of the present invention, on the other hand, are used to determine the risk associated with a portfolio before the actual return of the portfolio at a future date is known. Barr et al. utilizes a neural network trained with historical data, whereas the present invention models the evolution of a portfolio in the future under a range of future scenarios.

French discloses a system where three or more agents are created. Portions of a total sum of money are allocated to the agents, and each agent acquires desired investments not currently owned by the agent if the investments satisfy criteria associated with the agent. French nowhere contemplates or teaches a method of

simulating changes to the composition of the selected portfolio over time in view of one or more future scenarios to assess the risk associated with a portfolio. In contrast to the present invention, French contemplates the actual purchasing and selling of investments, whereby agents may be eliminated if they underperform (see e.g. French at col. 7, lines 32-38). While the present invention might be used to determine, for example, the undesirability of holding a specific portfolio at a certain time (based on the calculated risk metric) before any actual trades are made or any losses are incurred, the agents in French, on the other hand, which manage part of a portfolio of actual instruments, will have already performed actual trades and may have already incurred real losses before it is determined that the characteristics of the agent are undesirable. This is a significant difference which will be appreciated by persons skilled in the art.

It is accordingly submitted that the combination claimed in new claim 4 is not shown nor suggested by the Melnikoff, Edesess, Barr et al., or French references, alone or in combination, and should be allowed.

It is further submitted that new claims 5-17, which are directly or indirectly dependent on new claim 4, define subject matter which is not anticipated or obvious in view of the cited art, for substantially the same reasons as were discussed above in relation to new claim 4, namely that none of Melnikoff, Edesess, Barr et al., or French specifically require that changes to the composition of a portfolio be simulated over time in view of one or more future scenarios to assess the risk associated with the portfolio. Accordingly, it is submitted that new claims 5-17 should be allowed.

It is also submitted that new claims 18-33 recite a combination of features that is neither shown nor suggested by Melnikoff, Edesess, Barr et al., or French, taken alone or in combination.

New claim 18 recites a dynamic portfolio of instruments for use with a risk management system in a simulation, the composition of the portfolio being changeable over a plurality of times of interest and under a plurality of scenarios in the simulation, comprising a holding structure indicating instruments and their quantity in the portfolio and a strategy structure indicating at least one trade manager for which a trading strategy is defined, wherein the trading strategy of each of the at least one trade manager defines a desired result dependent on at least one tracked attribute, wherein the trading strategy is associated with at least one trading instrument, and wherein for each of the plurality of scenarios at a time of interest, the at least one trade manager simulates changes to the composition of the dynamic portfolio as defined in the holding structure, and wherein the execution of trades of the at least one trading instrument is simulated until said desired result is obtained, the dynamic portfolio having a changed composition after the changes are simulated, and wherein the changed composition is reflected in the holding structure.

It is submitted that new claim 18 defines subject matter which is not anticipated or obvious in view of the cited art, for substantially the same reasons as were discussed above in relation to new claim 4, namely that none of Melnikoff, Edesess, Barr et al., or French specifically require that changes to the composition of a portfolio be simulated over time in view of one or more future scenarios to assess the risk associated with the portfolio. Accordingly, it is submitted that new claims 18 should be allowed.

It is further submitted that new claims 19-33, which are directly or indirectly dependent on new claim 18, define subject matter which is not anticipated or obvious in view of the cited art, for substantially the same reasons as were discussed above in relation to new claim 4, namely that none of Melnikoff, Edesess, Barr et al., or French specifically require that changes to the composition of a portfolio be simulated over time in view of one or more future scenarios to assess the risk associated with the portfolio. Accordingly, it is submitted that new claims 19-33 should be allowed.

The applicant has also amended the disclosure at page 1 to correct a clerical error and to more clearly define the present invention. The applicant submits that no new matter has been added to the specification by the amendment.

The applicant has also amended the disclosure to add the missing application number of the application referred to on page 5 of the disclosure. In particular, the correction as requested by the Examiner in paragraph 1 of the office action have been incorporated in the amendments.

The applicant has also amended the disclosure at page 8 and page 10 to more clearly define the present invention. In particular, the amendments serve to clarify more explicitly what the term "the condition" at Page 8, lines 23-24 is referring to. Support for this amendment can be found at Page 6, lines 14-16, and Page 8, lines 21-26. It is also submitted that persons skilled in the art considering the specification at Page 8 line 27 to Page 9 line 7, will recognize that where such rules (i.e. band rule, barrier rule, comparison rule, functional rule, composite rule) are used, and where such rules can be assigned a boolean value (e.g. TRUE), then each of the rules will embody a condition. The applicant submits that the amendments serve merely to clarify the terminology used in the specification, and that no new matter has been added to the specification by the amendment.

The applicant has also cancelled claims 1-3. The objections raised by the Examiner in paragraphs 2 and 3 of the office action no longer apply. The applicant notes that the claims have been amended to clarify the distinctions between the present invention and the cited references, and that claims 1-3 have been cancelled rather than directly amended only for convenience, in view of the amendments to be made to the claims.

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Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

All objections and rejections have been addressed. It is respectfully submitted, therefore, that the present application is now in position for allowance, and a Notice to that effect is earnestly solicited.

If additional fees are required, please charge the fees to our Deposit Account No. 02-2095.

Respectfully submitted,

BERESKIN & PARR

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

Paragraph beginning at page 1, line 12, has been amended as follows:

One popular example of a known risk management system is the RiskWatch V3.1.2 system, sold by the assignee of the present invention. This system is very flexible and allows users to employ models of the instruments in the user's portfolio, which models are evaluated at appropriate time intervals, in view of a set of possible scenarios. Each scenario comprises a vector of values for risk factors employed in the models, at each time interval, and each scenario has associated with it a probability of the scenario occurring. The resulting risk values of the instruments, when the models are evaluated under each scenario at each time interval of interest, are then used to produce one or more risk metrics which are examined to assess the risk to the user of holding the portfolio of instruments under the evaluated scenarios. The instruments which can be modeled and assessed by the system are [is] not particularly limited. The system [and] merely requires that an adequate model can be defined for the instrument. Instruments can include, without limitation, various financial instruments such as equities, options, derivatives, etc. and can also include non-financial instruments such as reservoir capacities, insurance products, etc.

Paragraph beginning at page 5, line 11, has been amended as follows:

In co-pending U.S. patent application filed June 2, 1999, accorded serial number [•] 09/323,680 and assigned to the assignee of the present invention, a novel risk management system is disclosed and the contents of this reference are incorporated herein by reference. As shown in Figure 1, this novel risk management system 20 can include one or more risk engines 24 which operate on models of instruments employing risk factors and the values of these risk factors are defined in scenarios that are stored in a database 28. Risk engines 24 evaluate the models with the corresponding sets of risk factor values of a scenario to determine risk values for the scenario which are also stored in database 28. System 20 further includes one or more aggregation engines 32 which operate to retrieve determined risk values from database 28 to determine appropriate risk metrics for a portfolio of the instruments stored in database 28.

Paragraph beginning at page 8, line 21, has been amended as follows:

In a present embodiment of the invention, a rule or rules defined in Rule structure 160 can be of any one of five types of rules that embody a condition, namely: a band rule; a barrier rule; a comparison rule; a functional rule; and a composite rule[;]. Where a rule is of a type that embodies a condition, [and] each rule or set of

rules returns a "TRUE" value when the condition of interest is present in the portfolio under the present scenario and time, and a "FALSE" value at all other times. <u>Where a Trade Manager 128 has rules of a type that embody a condition,</u> a Trade Manager 128 only initiates trades when its rule, or rules, are TRUE. --

Paragraph beginning at page 10, line 26, has been amended as follows:

Thus, at step 204, the selected Trade Manager 128 queries aggregation engine 32 to retrieve the required attribute values from database 28 or to determine derived values by invoking a risk engine 24, as needed. At step 208 the rule, or rules in the case of a multiple rule Trade Manager, in Rule structure 160 is evaluated with the attribute values. At step 212, a determination is made as to whether the rule, or rules <u>that embody a condition</u> [,] in Rule structure 160 is TRUE. If the rule or rules are TRUE, <u>step 216 is performed, wherein</u> the Trade Manager <u>128</u> updates the positions in the dynamic portfolio <u>100</u>, to simulate appropriate trades, of those instruments indicated by the Trade Position list 176, to obtain the targets indicated by Target Vector 172, while updating the positions of the appropriate instruments indicated by Funding Position list 180, as required.

In the Claims:

Claims 1-3 have been cancelled.

New claims 4-33 have been added as follows:

4.   (new) A method of determining risk associated with a portfolio comprising a plurality of instruments in a simulation, by simulating changes to the composition of the portfolio over a plurality of times of interest and under a plurality of scenarios, comprising the steps of:

(a)   creating a dynamic portfolio having an initial composition as defined by a user;

(b)   defining a trading strategy for the dynamic portfolio, wherein the trading strategy defines a desired result dependent on at least one tracked attribute, and wherein the trading strategy is associated with at least one trading instrument;

(c)   for each of the plurality of scenarios, simulating at a first time of interest, changes to said initial composition of said dynamic portfolio wherein the execution of trades of said at least one trading instrument is simulated until said desired result is obtained, said dynamic portfolio having a

changed composition after said changes to said initial composition are simulated; and

(d)   producing a risk metric for said dynamic portfolio.

5.   (new) The method as claimed in claim 4, wherein said trading strategy comprises at least one rule.

6.   (new) The method as claimed in claim 4, wherein the method comprises after step (c), the step of continuing said simulation using the dynamic portfolio having said changed composition.

7.   (new) The method as claimed in claim 6, wherein the method comprises the step of simulating at a subsequent second time of interest, changes to said changed composition of said dynamic portfolio wherein the execution of trades of said at least one trading instrument is simulated until said desired result is obtained , said dynamic portfolio having a third composition after said changes to said changed composition are simulated.

8.   (new) The method as claimed in claim 6, wherein the method comprises the step of simulating at a plurality of subsequent times of interest, changes to the composition of said dynamic portfolio wherein the execution of trades of said at least one trading instrument is simulated until said desired result is obtained, wherein the composition of said dynamic portfolio at each time of interest of said plurality of subsequent times of interest reflects changes previously made to the composition of said dynamic portfolio.

9.   (new) The method as claimed in claim 8, wherein the quantity of said at least one trading instrument available for trading at each time of interest has been predetermined by the user.

10.   (new) The method as claimed in claim 8, wherein said trading strategy is also associated with at least one funding instrument for funding the execution of trades in the simulation.

11.   (new) The method as claimed in claim 10, wherein the quantity of said at least one funding instrument available for trading at each time of interest has been predetermined by the user.

12.   (new) The method as claimed in claim 5, wherein said at least one rule comprises a condition, and wherein step (c) is performed only when said condition is satisfied.

13.   (new) The method as claimed in claim 12, wherein each of said at least one rule is selected from the following group: a band rule, a barrier rule, a comparison rule, a functional rule, a composite rule.

14.   (new) The method as claimed in claim 5, wherein step (b) is repeated such that a plurality of trading strategies are defined, and wherein said plurality of trading strategies jointly define a desired result.

15.   (new) The method as claimed in claim 5, wherein step (b) is repeated such that a plurality of trading strategies are defined, and wherein each of said plurality of trading strategies define a desired result.

16.   (new) The method as claimed in claim 15, wherein each of said plurality of trading strategies is assigned a priority.

17.   (new) The method as claimed in claim 16, wherein step (c) is performed for each of said plurality of trading strategies in order of priority.

18.   (new) A dynamic portfolio of instruments for use with a risk management system in a simulation, the composition of said portfolio being changeable over a plurality of times of interest and under a plurality of scenarios in said simulation, the portfolio comprising:

(a)   a holding structure indicating instruments and their quantity in the portfolio;

(b)   a strategy structure indicating at least one trade manager for which a trading strategy is defined, wherein the trading strategy of each of said at least one trade manager defines a desired result dependent on at least one tracked attribute, wherein said trading strategy is associated with at least one trading instrument;

wherein for each of the plurality of scenarios at a time of interest, said at least one trade manager simulates changes to the composition of said dynamic portfolio as defined in said holding structure, and wherein the execution of trades of said at least one trading instrument is simulated until said desired result is obtained, said dynamic portfolio having a changed composition after said changes are simulated, and wherein said changed composition is reflected in said holding structure.

19.   (new) The dynamic portfolio of instruments for use with a risk management system in a simulation as claimed in claim 18, wherein said trading strategy comprises at least one rule.

20. (new) The dynamic portfolio of instruments for use with a risk management system in a simulation as claimed in claim 18, wherein the quantity of said at least one trading instrument available for trading at each time of interest has been predetermined by the user.

21. (new) The dynamic portfolio of instruments for use with a risk management system in a simulation as claimed in claim 18, wherein said trading strategy is also associated with at least one funding instrument for funding the execution of trades in the simulation.

22. (new) The dynamic portfolio of instruments for use with a risk management system in a simulation as claimed in claim 21, wherein the quantity of said at least one funding instrument available for trading at each time of interest has been predetermined by the user.

23. (new) The dynamic portfolio of instruments for use with a risk management system in a simulation as claimed in claim 19, wherein said at least one rule comprises a condition.

24. (new) The dynamic portfolio of instruments for use with a risk management system in a simulation as claimed in claim 23, wherein each of said at least one rule is selected from the following group: a band rule, a barrier rule, a comparison rule, a functional rule, a composite rule.

25. (new) The dynamic portfolio of instruments for use with a risk management system in a simulation as claimed in claim 18, wherein each trading strategy of said at least one trade manager is assigned a priority.

26. (new) A risk management system operable on a set of instruments and a set of scenarios, each scenario including risk factor values and a scenario probability, said system comprising:

   (a) at least one risk engine operable to determine a risk value for each instrument in said set of instruments, said risk value determined by evaluating, in view of said risk factors in said scenario, a model stored for said instrument;

   (b) a database to store said risk value for each instrument in said set of instruments;

   (c) at least one dynamic portfolio of claim 18; and

(d) an aggregating engine to retrieve said determined risk values and said scenario probabilities for said dynamic portfolio to produce a risk metric corresponding to the composition of said dynamic portfolio.

27. (new) The risk management system of claim 26, wherein said trading strategy comprises at least one rule.

28. (new) The risk management system of claim 26, wherein the quantity of said at least one trading instrument available for trading at each time of interest has been predetermined by the user.

29. (new) The risk management system of claim 26, wherein said trading strategy is also associated with at least one funding instrument for funding the execution of trades in the simulation.

30. (new) The risk management system of claim 29, wherein the quantity of said at least one funding instrument available for trading at each time of interest has been predetermined by the user.

31. (new) The risk management system of claim 27, wherein said at least one rule comprises a condition.

32. (new) The risk management system of claim 31, wherein each of said at least one rule is selected from the following group: a band rule, a barrier rule, a comparison rule, a functional rule, a composite rule.

33. (new) The risk management system of claim 26, wherein each trading strategy of said at least one trade manager is assigned a priority.